

KSC CRITICAL LIFT DETERMINATION PROCESS

BACKGROUND

NASA-STD-8719.9, Standard for Lifting Devices and Equipment (LDE), paragraph 1.5.1, mandates the development of a process to identify critical lift operations and LDE. Refer to excerpt below:

“1.5.1 Critical lifts are lifts where failure/loss of control could result in loss of life, loss of or damage to flight hardware, or a lift involving special high dollar items, such as spacecraft, one-of-a-kind articles, or major facility components, whose loss would have serious programmatic or institutional impact. Critical lifts also include the lifting of personnel with a crane, lifts where personnel are required to work under a suspended load, and operations with special personnel and equipment safety concerns beyond normal lifting hazards. Personnel shall not be located under suspended or moving loads unless the operation adheres to the OSHA-approved NASA Alternate Standard for Suspended Load Operations (see Appendix A). Lifting of personnel with a crane shall be in accordance with 29 CFR 1926.550 (see Appendix C).

a. Each installation or program shall develop a process to identify critical lifting operations and lifting devices/equipment that must meet critical lift requirements. Input shall be gathered from facility, program, user, and assurance personnel. The results of the process shall be documented and approved, as a minimum, by the installation LDEM.

b. It is NASA policy that the comprehensive safeguards outlined in this standard be provided for critical lifting operations. This includes special design features, maintenance, inspection, and test intervals for the lifting devices/equipment used to make critical lifts.

c. Specific written procedures shall be prepared and followed for all critical lifts.

d. During critical lifts there shall be one person present (NASA or contractor) that is designated as responsible for the safety of the operations. That person may be a safety professional, a supervisor, an engineer, or a task leader.”

Historically, nearly all critical lifts at KSC were identified by the Program and controlled per Operation and Maintenance Instruction (OMI). In the rare case a lift not controlled per OMI required assessment, the KSC Lifting Devices and Equipment Manager (LDEM) in conjunction with the responsible Engineering, Safety and Mission Assurance, Program, and Operations organizations would determine the criticality of the lift and take appropriate steps to ensure compliance with NASA-STD-8719.9.

With the end of the Space Shuttle Program and the uncertainty of future Programs and operations, KSC has instituted the following process whereby operations may be assessed for classification as critical lifts. While future Programs retain the right to classify and control their own critical lifts in accordance with the requirements of NASA-STD-8719.9, the process contained in this document lays out an alternate framework which may be used to assess an operation, determine criticality of the lift, and document the results.

KSC CRITICAL LIFT DETERMINATION PROCESS

GROUND RULES

1. This Critical Lift Determination Process is applicable only to NASA Operations as defined in NASA-STD-8719.9 (i.e. activities or processes under NASA direct control or including major NASA involvement). Construction of Facilities and other lifts not involving NASA Operations shall comply with 29 CFR, KNPR 8715.7, and other requirements per the respective contract.
2. When a “critical lift” is designated by a Program or otherwise clearly identified using the NASA-STD-8719.9 definition of the term, it is not necessary to conduct this Critical Lift Determination Process.
3. The term “flight hardware” as used in the NASA-STD-8719.9 definition of the term “critical lift” refers to “spaceflight hardware” and is not intended to drive critical lift requirements for lifts involving KSC aircraft or associated equipment.
4. The following terms are consistent with the intent and scope of NASA-STD-8719.9 and shall be used for the purposes of this Critical Lift Determination Process.

Critical Lift: Lifts where lifting devices and equipment (LDE) failure or loss of control could result in loss of life, or loss of/damage to Critical Hardware/Facility; additionally, all lifts of personnel with a crane or where personnel are required to work under a suspended load are considered critical lifts.

Critical Hardware/Facility: Hardware or facility whose damage or loss would result in unacceptable programmatic or institutional impact as determined by the Responsible Authority.

Responsible Authority: Program Manager, Center Director, or their designees authorized to accept programmatic or institutional risk.

Noncritical Lift: Lifts of items other than Critical Hardware/Facility involving routine lifting operations governed by standard industry rules and practices.

Special Concerns Lift: Noncritical lifts where special safety concerns exist. Examples may include: proof load tests and engineered lifts; lifts using multiple cranes; lifts of explosives, pressurized vessels, or hazardous materials; lifts associated with demolition where the weight of the load is not known; lifts within a boom length of power lines; lifts of objects submerged in water; and lifts over occupied buildings, public roadways, etc.

KSC CRITICAL LIFT DETERMINATION PROCESS

PROCESS PARTICIPANTS

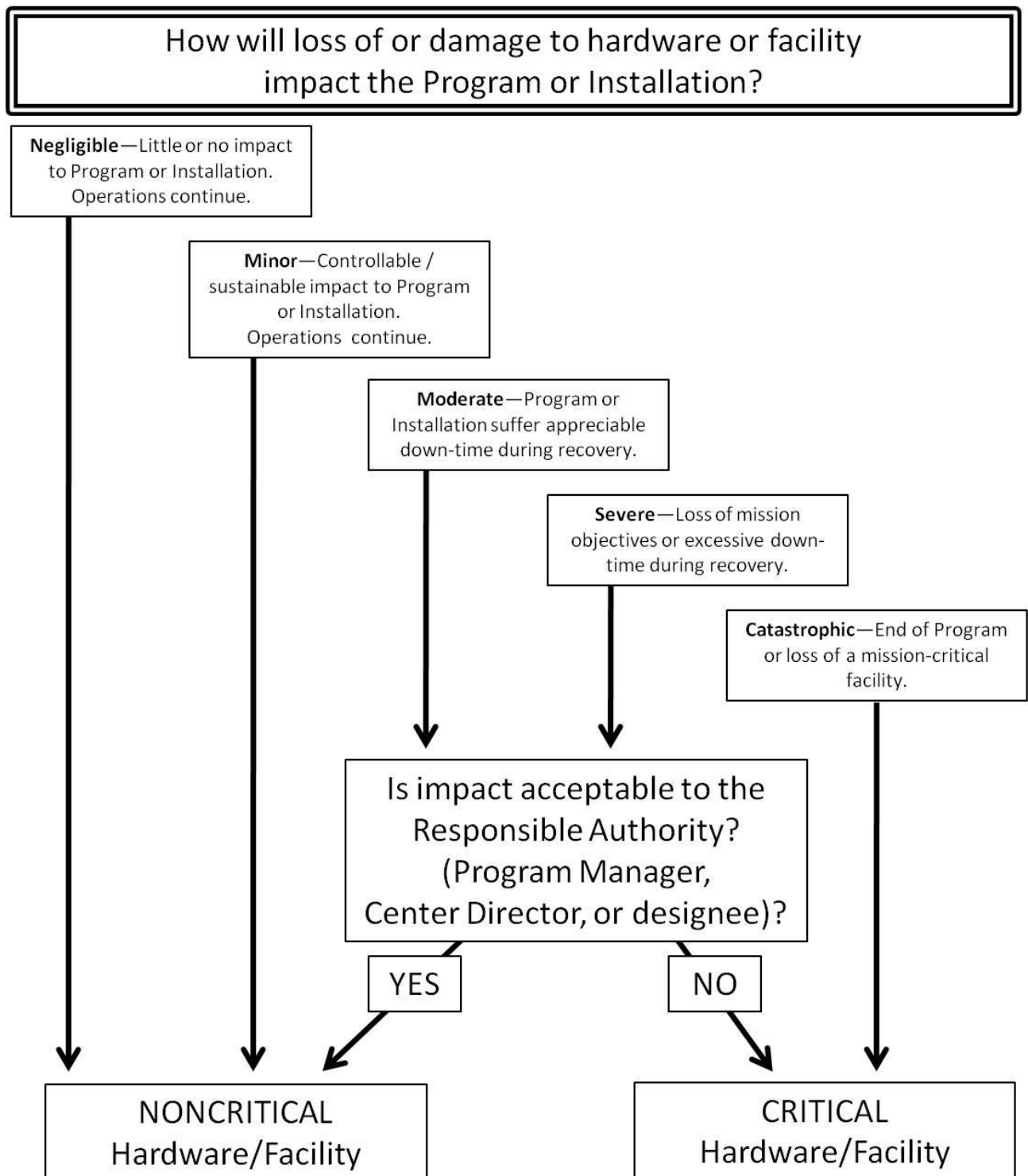
The initial assessment shall be conducted by members of the KSC LDE Committee including the KSC LDEM and representatives of the responsible Engineering, Safety and Mission Assurance, and Operations organizations. Other interested parties may participate as necessary.

PROCESS STEPS

1. Determine Critical Hardware/Facility Classification using the flowchart on page 4.
 - a. If the LDE Committee determines the loss of / damage to hardware or facility to be Negligible, Minor, or Catastrophic, document the lift in accordance step 3 below. No Responsible Authority signature is required.
 - b. Where loss of / damage to hardware or facility is determined to be Moderate or Severe, or where the LDE Committee has reason to elevate the issue to the Responsible Authority, the Critical Hardware/Facility Classification shall include the responsible Program Manager and/or Center Director or their designees. Subsequent documentation shall include approval / concurrence of the Responsible Authority.
2. Apply the Critical Hardware/Facility Classification from step 1 to the Critical Lift Determination using the flowchart on page 5.
3. Document the results of Critical Lift Determination Process using the format on page 6. (Contact the KSC LDEM for assistance.)
4. KSC LDEM shall maintain copies of all critical lift determinations conducted using this process. (Note: Critical lifts identified and controlled by Programs shall be documented using Program-specific information systems.)

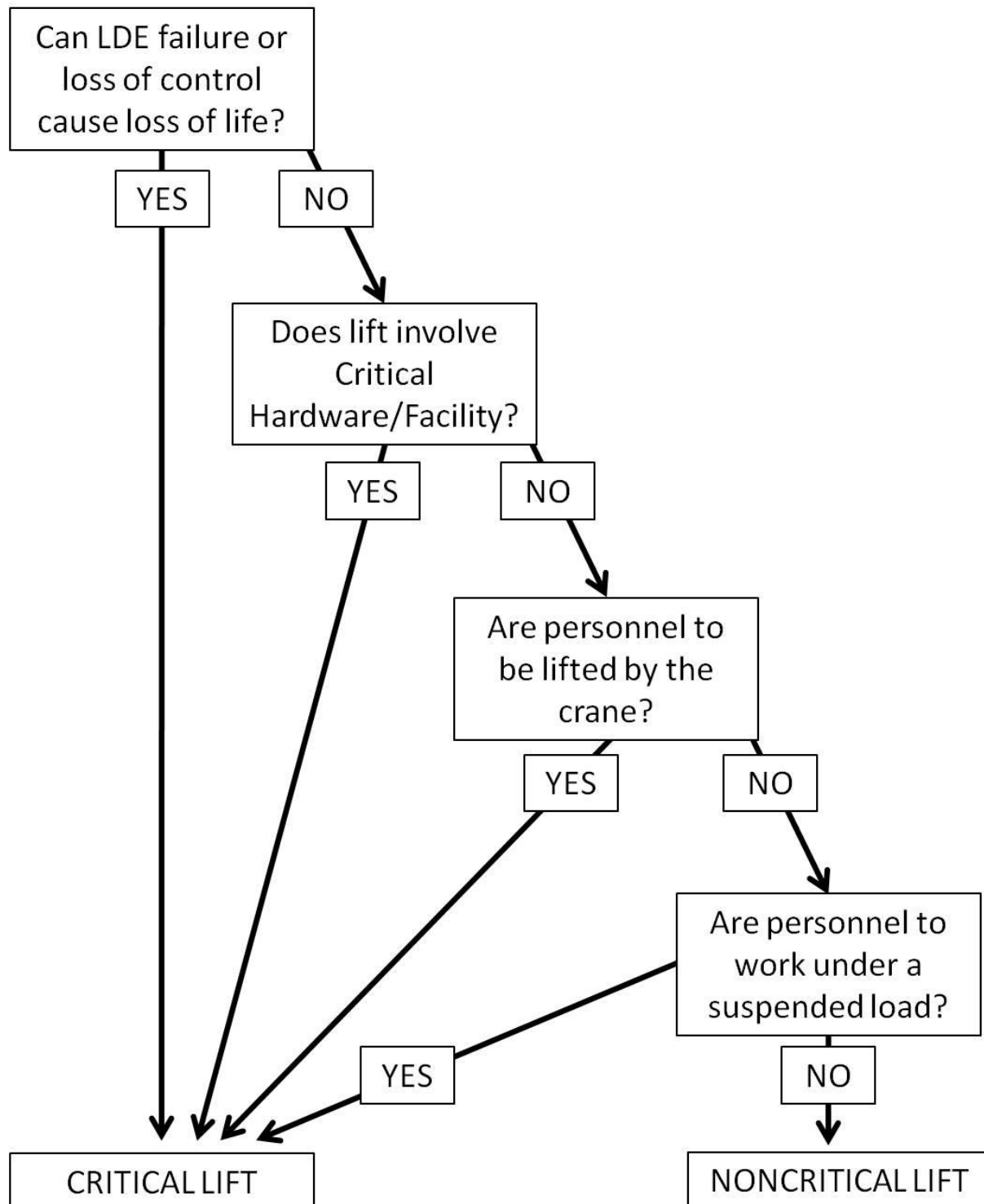
KSC CRITICAL LIFT DETERMINATION PROCESS

Critical Hardware/Facility Classification



KSC CRITICAL LIFT DETERMINATION PROCESS

Critical Lift Determination



KSC CRITICAL LIFT DETERMINATION PROCESS

Critical Lift Determination Document Format

ID #: KSC-CLDD-xxxx (*contact KSC LDEM for number assignment*)

1. Lifting Operation: *Describe the operation.*
2. Document answers to the following questions:
 - a. Can Lifting Devices and Equipment (LDE) failure or loss of control cause loss of life? (*If Yes, then Critical Lift.*)
 - b. Does lift involve Critical Hardware/Facility? (*If Yes, then Critical Lift.*)
 - i. Describe hardware or facility at risk.
 - ii. Identify Responsible Authority and designee if applicable.
 - iii. Describe how loss of or damage to hardware or facility affects / impacts the Responsible Authority's Program or Installation? (*If Catastrophic, then Critical Lift.*)
 - iv. If not Catastrophic, is impact acceptable to the responsible authority—Program Manager, Center Director, or designee? (*If Unacceptable, then Critical Lift.*)
 - c. Are personnel to be lifted by the crane? (*If Yes, then Critical Lift.*)
 - d. Are personnel required to work under a suspended load in accordance with Alternate Standard for Suspended Load Operations? (*If Yes, then Critical Lift.*)
3. Special Concerns: *Address as necessary.*
4. Dissenting Opinion(s): *Address as necessary.*
5. Signatories:
 - a. Responsible Authority (Program Manager, Center Director, or designee) if required.
 - b. Responsible Engineering Organization Representative
 - c. Responsible Operations Organization Representative
 - d. Responsible Safety and Mission Assurance Representative
 - e. Center Lifting Devices and Equipment Manager
 - f. Others as necessary

KSC CRITICAL LIFT DETERMINATION PROCESS

See <http://ksc-lde.ndc.nasa.gov/> for additional information and references.

Contact KSC LDEM for assistance:

joseph.a.torsani@nasa.gov 861-3806

or

alan.alemany@nasa.gov 861-6188